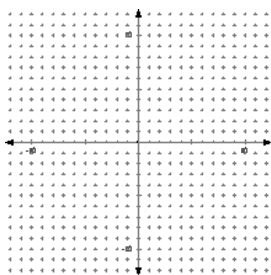


Warm-up!

Solve by graphing:

$y = -x + 1$

$2x + 4y = -2$



3-5 Solving Systems of Equations in 3 Variables

p138

Key Concept		System of Equations in Three Variables
One Solution <ul style="list-style-type: none"> planes intersect in one point 	Infinite Solutions <ul style="list-style-type: none"> planes intersect in a line planes intersect in the same plane 	
No Solution <ul style="list-style-type: none"> planes have no point in common 		

Consistent (at least one solution)

- ordered triple
- line
- plane

Inconsistent (no solution)

True statement

 ∞ # of solutions (could be a plane or line)

False statement

no solution

ex 1

① $2x - y - z = 1$

② $x + 2y + z = 0$

③ $3x - y - 2z = -1$

Eliminate z

① + ②

$2x - y - z = 1$

$x + 2y + z = 0$

$3x + y = 1$

$3x + y = -1$

We created 2 new equations w/ 2 variables

$$\begin{array}{r} 5x + 3y = -1 \\ -9x - 3y = -3 \\ \hline -4x = -4 \\ x = 1 \end{array}$$

Now eliminate z from ③

③ + 2×②

$3x - y - 2z = -1$

$2x + 4y + 2z = 0$

⑤ $5x + 3y = -1$

$(1, -2, 3)$

ex 2

① $2x + y - 2z = -2$

② $-x - 3y - 2z = 5$

③ $-4x - 2y + 3z = 2$

Substitution ① $y = -2x + 2z - 2$

Plug into ② & ③

$$-x - 3(-2x + 2z - 2) - 2z = 5$$

$$-x + 6x - 6z + 6 - 2z = 5$$

$$5x - 8z = -1$$

$$-4x - 2(-2x + 2z - 2) + 3z = 2$$

$$-4x + 4x - 4z + 4 + 3z = 2$$

$$-z = -2$$

$$z = 2$$

$$5x - 8(2) = -1$$

$$5x - 16 = -1$$

$$5x = 15$$

$$x = 3$$

$$(3, -4, 2)$$

Do:

$$2x + y + z = 0$$

$$x - 2y + z = 2$$

$$3x - y + 2z = 2$$

$$x + 3y = -2$$

$$x + 3y = -2$$

$$0 = 0$$

 ∞ # of sol's

ex 3:

$$x - 3y + 4z = 10$$

$$2x - y - z = 7$$

$$x - 4y = 1$$

HW

p142-143

12, 16, 17, 19, 20